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| 10/729,428 | 12/05/2003 | Steven Eckroad | 1036/3US | 8412 |
| 68553 7590 07/24/2009 TREGO, HINES & LADENHEIM, PLLC 9300 HARRIS CORNERS PARKWAY SUITE 210 CHARLOTTE, NC 28269-3797 | | | | |
| EXAMINER CAVALLARI, DANIEL J | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/729,428

Applicant(s)

ECKROAD ET AL.

Examiner

DANIEL CAVALLARI

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-17, 19-22, 24-27 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-17, 19-22, 24-27 and 29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's After Final arguments filed 7/9/2009 have been fully considered.

The Declaration filed on 2/23/2009 under 37 CFR 1.131 has been considered and is effective to overcome Bender et al. (US 2003/0016702). Therefore, Applicant's request for reconsideration of the finality of the rejection of the last office action of 3/12/2009 is persuasive and, therefore, the finality of that action is withdrawn. However, this action is made final as necessitated by the amendments of 7/9/2009.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claim 1

The limitation of an "electric power generator **independent from** a utility power system" is unclear. Particularly, since Applicant teaches a power supply system integrated and in cooperative operation with a utility (see Figure 4C) and not a power generator "independent"

from a utility, it is unclear what is meant by an electric power generator "independent from" a utility power system.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4-10, 16, 22, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura (JP 2001-286078) [note paragraph references under the Tamura rejection are in reference to the provided English translation of the Japanese document] in view of Jungreis et al. (US 6,134,124).

In regard to Claims 1 and 22

Tamura teaches:

An electrical power source comprising:

- A static converter (20, Figure 1) continuously converting power to a fixed frequency AC output power (See paragraphs 23-28, noting the inverter (20) provides series compensation in a "compensation mode" and provides power from battery (30) in a UPS mode. Further noting that the input is fixed, see paragraph 18).
- An electrical power storage subsystem (10, 30) [UPS] (See Figure 1).
- An electrical power generator module (60, Fig 1).

- A multimode control system (85, 100, 200, Fig 1) operably connected to the static converter, the electrical power storage subsystem and the electrical power generator, such that the control system selectively connects the static converter, the electrical power storage subsystem, **OR** the electrical power generator (noting generator 60 selectively connected via switch 80, fig 1) independently **OR** in combination to the electric load, thereby allowing continuous backup power is provided to the load by both the electric power storage subsystem and the electrical power generator simultaneously and cooperatively (see paragraphs 20-30).

Tamura teaches a power generator (power source 60) but fails to explicitly teach that said power source is separate from a utility power system. However, Jungreis teaches an electric power system wherein a generator (10, fig 1) and a utility (4) are connected via a common AC bus (see fig 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a separate utility connection in combination with a generator connection in place of the single generator connection (60 of Tamura) as taught by Tamura. The motivation would have been to provide a power system capable of extended power supply with greater backup power capabilities to critical loads.

Tamura further teaches:

In regard to Claim 2

- Wherein the control system provides a plurality of modes of operation including at least a static compensator and an uninterruptible power supply operational mode (See Paragraphs 19-30).

In regard to Claim 4

- Wherein the control system provides a multiplicity of generator connection modes, including a dc-connected generator mode (read on by a battery) and an ac-connected generator mode (See Figure 1).

In regard to claim 5

- Wherein the control system comprises a feedback loop (See paragraphs 55-62).

In regard to Claims 6, 24, and 25

- Wherein the control system comprises a current control system coupled with the electrical power storage subsystem and the electrical power generator and a voltage control system coupled with at least the electrical power storage subsystem (See paragraphs 55-62) [noting the controller controls the generator by connecting and disconnecting the generator via the switch, as controlled by the controller].

In regard to Claim 7

- Wherein the current control system includes a current controller (150, Fig 10) coupled with a pulse pattern generation unit (160, Fig 10) and the pulse pattern generation unit

couples with the electric power storage subsystem and is configured to supply control signals to the electrical power storage subsystem (10) (see Fig 9 and paragraph 15).

In regard to Claim 8

- Wherein the voltage control system includes a voltage source converter controller (180, Fig 10 and paragraph 55) coupled with the pulse pattern generation unit and the pulse pattern generation unit couples with the electrical power storage subsystem and is configured to supply control signals to the electrical power storage subsystems.

In regard to Claims 9 and 27

- Wherein the energy storage system [noting the lack of antecedent basis for “energy storage system” wherein claim should read “the electric power storage subsystem”] includes a VSC (560) coupled with an energy storage unit (30), wherein the energy storage unit is configured to store electrical energy and the VSC is configured to draw energy from the energy storage unit (see Fig 7) and supply electrical energy to the energy storage unit (see paragraph 103-104 noting how the converter 10 forms a loop which draws and supplies power to the storage unit).

In regard to Claims 10 and 26

- Wherein the control system further comprises a detection and mode selection unit (85, see paragraph 102) couple with the current control and voltage control and configured to determine the mode of operation of the apparatus (See Paragraph 102).

In regard to claim 16

Incorporating all arguments above, Tamura teaches the use of a DC source (See Figure 9) but fails to explicitly teach the use of compressed air energy storage.

Jungreis et al. teach a UPS system incorporating compressed air energy storage (See Column 2, Lines 42-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the compressed air energy storage taught by Jungreis et al. with the system of Tamura. The motivation would have been to take advantage of the low energy consumption of compressed air energy storage systems.

Claims 11, 12, 14, 15, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura in view of Jungreis et al., and Hingorani, N.G. "Introducing Custom Power".

In regard to claim 11

Tamura teaches the use of a switch (80, Fig 9) which is opened and closed to an AC line in response to the detection and mode selection unit (85) (See Paragraph 102) but fails to explicitly teach (1) a "grid"; and (2) the use of a solid state breaker.

Hingorani teaches a STATCOM energy supply system comprising a power grid and the use of solid state breakers (page 44, "Power electronics in control") used in a power generation system to connect a power feed to a load (see Fig, page 45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the grid AC power supply and solid state breaker taught by Hingorani into the system of Tamura who is silent in regard to the specific type of AC source and switch used. The motivation would have been to provide a simple, well known and well available AC source and switch capable of handling high voltages and high currents.

In regard to claims 12, 14, 15, and 29

Tamura teaches the use of a storage subsystem [noting there is a lack of antecedent basis for “storage subsystem” and the claim should read “the electrical storage subsystem”] comprises a (1) battery; or (2) superconducting magnets; or (3) capacitor.

Hingorani teaches an electrical storage subsystem comprising a (1) battery; or (2) superconducting magnets; or (3) capacitor (see figure, page 45).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a specific DC storage medium as taught by Hingorani using a (1) battery; or (2) superconducting magnets; or (3) capacitor. The motivation would have been to provide a superior source of power known in the art.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura in view of Jungreis et al., and Heinemann et al. (hereinafter referred to as Heinemann), “Economical Power Quality Enhancement in MV Distribution Networks by Power Electronics Solutions (IEE 2001 Conference).

Incorporating all arguments above in regard to the electrical power system taught by Tamura, Tamura fails to explicitly teach the use of a flywheel as a source of power. Heinemann teaches an electrical power system comprising static compensation also comprising a flywheel energy store (see Section 4 “Next Generation of PQ-Systems” and Figure 3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the flywheel in place of the DC storage taught by Tamura who fails to explicitly teach the DC source used. The motivation would have been to take advantage of the flywheels earth friendly characteristics as opposed to batteries and other chemically based DC storage systems.

Claims 17 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamura, Jungreis et al., and Yalla et al. (US 5,581,173) (hereinafter referred to as Yalla).

Incorporating all arguments above, Tamura teaches an electrical power system comprising control components (see Figs 9 and 10) however fails to explicitly teach the physical composition of these components. Particularly, whether they comprise hardware/software, a combination of both or control circuitry in interchangeable module form.

In regard to Claim 17 and 20

Yalla teaches an electric power system comprising an interchangeable modular control system [noting Tamura teaches the control circuitry (Fig 9) but fails to teach it in interchangeable

module form] specifically configured for controlling the operation of the electrical power system (see column 3, lines 20-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the interchangeable modular configuration taught by Yalla into the system of Tamura. The motivation would have been to provide a module configuration (ie interchangeable combination software, hardware) allowing easy upgrades, maintenance, and the ability to interchange the control module with a second electrical generator.

In regard to Claim 19 and 21

Yalla teaches the control module is chosen from the group comprising a software configuration and a hardware configuration (see column 11, lines 4-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the module configuration taught by Yalla into the system of Tamura. The motivation would have been to provide a module configuration (ie combination software and hardware) allowing easy upgrades, maintenance, and the ability to interchange the control module with a second electrical generator.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Cavallari whose telephone number is 571-272-8541. The examiner can normally be reached on Monday-Thursday 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford Barnie can be reached at (571)272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DJC/

July 21, 2009

/Albert W Paladini/

7/23/09

Primary Examiner, Art Unit 2836